

REMARKS

Formalities

Entry of this after-final Amendment is requested. The amendments included herein provide for a more concise abstract, as requested by the Examiner. Further, the amendments to claims 8, 10, 15 and 16 do not require further consideration and/or searching. In particular, independent claim 8 has been amended merely to include the calibrating step previously recited in dependent claim 10; claim 10 has been amended merely to delete the calibrating step added to claim 8; claim 15 has been amended merely to include the same clarifying language as previously presented in claim 1; and claim 16 has been amended merely to delete duplicative language.

Abstract

The abstract of the invention was objected to for allegedly failing to focus on the claimed invention. Applicant respectfully submits that the abstract as filed does, in fact, satisfy the requirements for an appropriate abstract of the invention, as set forth for example in MPEP §608.01(b). In particular, the abstract as filed includes that which is new in the art. That is, the abstract as filed includes utilizing calibrated spoken words in the measurement of speech intelligibility. However, to place the abstract of the invention in more concise language, Applicant has amended the abstract of the invention for purposes of conciseness.

Drawings & Claim Rejections Under 35 U.S.C. §112, ¶¶1 & 2

Initially, with respect to figures 1C and 1D, these figures are not prior art and should not be labeled as such. To address the examiner's concern regarding reference to the ANSI standard in the figures, Applicant proposes to delete this reference from each of the figures as illustrated in the replacement figures submitted herewith.

Regarding figures 1A and 1B, Applicant submits herewith replacement figures 1A and 1B in block form to replace the previously filed photographs.

Further, the drawings were objected to for not explicitly showing a "calibrated spoken word". Further, claims 1-16 are rejected under 35 U.S.C. § 112, ¶¶1 & 2 for essentially the same reason as the drawings were objected. Essentially, the grounds of rejection assert that "calibration", as that term is used in the claims, is not enabled by the specification (§112, ¶1) and, thus, the claimed term is indefinite because it is "unclear what is being done to achieve this desired result." (§112, ¶2). The drawings are objected to "because there is no figure showing a 'calibrated spoken word.'"

As described in detail in the Amendment filed on October 18, 2005, in response to the non-final office action dated July 18, 2005, Applicant submits that a skilled artisan would understand that "calibrating" a previously recorded word, as that term is used in the present specification and claims, means that the respective sound energy of that word is set to "substantially the same sound energy" as the other recorded words, "at least as viewed against some common scale." (See, e.g., Claim 1 and Specification, page 5, lines 22-23). It is further described that calibrating the recorded words in this manner "insures that the SI testing measures speech reception across words having the same or similar energies." (See, e.g., Specification, page 5, lines 24-25). Further, it is disclosed that;

two of the common scales which the inventor has used to calibrate the words are the Root Mean Squared (RMS) energies of a waveform representative of the words (e.g., a computer data file containing binary information representative of a voltage waveform produced by a microphone), and positive peak values (such positive peak values relative to a defined baseline) of waveforms representative of the words (e.g., a computer data file containing binary information representative of a voltage waveform produced by a microphone)."

(Specification, page 5, line 25 through page 6, line 2).

Further, on page 9, lines 2-8 of the specification, it is disclosed that in one exemplary embodiment the "calibrated" spoken words are derived by scaling each recorded word, for example, in a succession of WAV files, "such that the RMS energy of the waveforms of the recorded words are substantially equal." In another exemplary embodiment the "calibrated" spoken words are "achieved by a computer program running internal to the system unit" to scale each recorded word, for example, in a succession of WAV files, "such that the positive peak value of the waveforms representative of the recorded words are substantially equal." (Page 9, lines 13-18). It is also disclosed that the individual peak-to-peak values, maximum-absolute-peak value, etc. may also be used to scale the waveforms. (Specification, page 9, lines 20-21).

Thus, one of ordinary skill in the art would know that in accordance with the disclosed exemplary embodiments of the invention, a computer data file representative of voltage waveforms produced by a microphone, such as WAV files of recorded words, are scaled in order to make the sound energy of each recorded word the same, thus "calibrating" the recorded words.

In the present application Applicant is not claiming novelty in any particular method or methods of calibrating the recorded words. It is noted that Applicants' related copending application, Ser. No. 10/025,725, discloses and claims a particular method of calibrating audiometry stimuli. In the present application, Applicant has disclosed and claimed a novel method of determining speech intelligibility, the method utilizing any one or more of various calibration techniques that result in the recorded spoken words having substantially the same sound energy. Applicant respectfully submits that one of ordinary skill in the art would be able to make and use the invention claimed in view of the present application, including the specification and drawings. As already discussed, a skilled artisan would know how to

perform a calibration procedure in accordance with the present invention, e.g., by scaling WAV files of the recorded words to have substantially the same sound energy.

Because a skilled artisan would know how to perform a method of determining speech intelligibility, including a “calibration” procedure, in accordance with the claimed invention, particularly after reading the current specification, Applicant submits that the claims are enabled under 35 U.S.C. § 112, ¶1.

The grounds of rejection assert that “conflicting evidence” exists in the specification with respect to the novelty of the use of the disclosed and claimed calibration step. In particular, the grounds of rejection assert that the discussion on page 2, lines 15-18, of the specification, which is in reference to the prior art, would apparently motivate “one of pedestrian skill in the art of speech signal processing” to perform “some form of calibration on the words being used to ensure that loudness for each word (however measured) is the same.” This logic, however, contravenes the teachings of the prior art and misinterprets the discussion thereof in the present specification.

In particular, on page 2 of the specification it is explained that in accordance with one type of speech intelligibility testing, a test subject is presented with a series of words played through headphones or speakers. (Specification, page 2, lines 14-15). The specification further explains:

The played back words are all intended to be at the same sound intensity, or loudness, *which is generally ensured by making sure that the loudness control of the system through which the words are being played is the same for all played back words*; that is, the loudness at which the system through which the words are being played back is controlled (e.g., the gain of the amplifier driving the speakers or headphones through which the words are being played back).

(Specification, page 2, lines 15-20, emphasis added).

The above portion of the specification cited by the Examiner is not referring to the claimed calibration procedure. To the contrary, the above quoted passage from the specification is referring to the problematic prior art method of conducting speech intelligibility testing where the loudness, or amplifier gain, of the loudspeaker providing the sounds to the test subject was set at the same value *for all recorded words*, that is, regardless of any discrepancy in the relative sound energies of each individual word. As discussed on page 5 of the specification, this prior art technique leads to difficulties because each recorded word may have been recorded at a different energy level. As recognized for the first time by the inventors of the present invention, maintaining the *loudness* setting of the amplifier the same for all played back words, i.e., words recorded with different sound energies, introduces "inaccuracies into the SI testing." For example, leaving the amplifier level (loudness) the same for words recorded at a shouting energy level and for those recorded at a whisper energy level affects the test subject's ability to discern between the two.

To address this issue, the inventors introduced the novel concept of calibrating the recorded words prior to being provided to the test subject. Accordingly, if the loudness level were maintained constant during a test administered in accordance with the present invention, the differences between the shouted word and the whispered word would be accounted for, i.e., by calibrating the words in the manner claimed, and the inaccuracies experienced by the prior art SI testing methods would be avoided. Without the knowledge provided to the skilled artisan by reading the present specification, the sound energies of the recorded words would not be equalized and, thus, the words would not be calibrated in the manner claimed, by a previously known method of calibration or otherwise, before presenting the calibrated words to the test subject.

Further, as discussed above, contrary to the Examiner's assertion at page 7, ¶7 of the office action, the claimed calibration requirement does, in fact, "find sufficient disclosure under 35 U.S.C. § 112, ¶1." See, for example, the specification at pages 2, 4-6 and 9. Accordingly, in addition to obviating the rejection under 35 U.S.C. § 112, ¶1, the apparent basis for the Examiner's rejection under 35 U.S.C. § 112, ¶2, is also rendered moot. Particularly, the grounds of rejection assert that claims 1-16 are indefinite because it is unclear how to achieve the calibration step recited in the claims. As noted above, however, the specification clearly informs a skilled artisan how to carry out the claimed invention, including the calibration step.

Lastly, with respect to the drawings, for similar reasoning as set forth above with respect to the claim rejections under 35 U.S.C. §12, ¶¶1 & 2, Applicant respectfully submits that no detailed drawing of an exemplary calibration procedure is required. The application as originally filed provides one of ordinary skill in the art all the information necessary to make and use the invention. As discussed, an exemplary drawing illustrating one of various possible calibration processes consistent with the invention is not necessary for an understanding of the invention.

Alleged New Matter

The grounds of rejection allege that the Amendment filed October 18, 2006 introduced "new matter" by adding the language, "calibrating at least one recorded spoken word by controlling each of the at least one recorded spoken words to have substantially the same sound energy." Applicant respectfully disagrees with the characterization that this language is "new matter." The specification clearly supports this language, as discussed at length above and in previous responses. Ample support for this recitation in the claims is

found, for example, at page 5, line 21 through page 6, line 10; page 9, lines 2-8 and page 9, lines 13-23 of the specification as originally filed.

37 CFR 1.78(b)

The grounds of rejection allege that claims 1-5 of the present application conflict, under 37 CFR 1.78(b), with claims 1-4 of copending application no. 10/025,045. Applicant respectfully disagrees, albeit without understanding whether the claims are rejected or merely objected to under this provision of the rules. Additionally, the Examiner has failed to point out that which is in conflict with respect to these claims. Accordingly, it is requested that this objection/rejection be withdrawn or at least presented in a further office action including a detailed explanation as to how the indicated claims are in conflict.

That said, Applicant points out that claims 1-5 of the present application include, *inter alia*, “measuring speech intelligibility indicative of a percentage of the presented at least one calibrated spoken word or words that the test subject successfully identified.” In comparison, claims 1-4 of copending application ser. no. 10/025,045 include, *inter alia*, “measuring a speech reception threshold indicative of a sound level at which the test subject can recognize the presented recorded spoken word or words.” It is clear that claims 1-5 in the present application are different than claims 1-4 of copending application no. 10/025,045 and, further, the claims do not conflict with each other.

Rejection of Claims 1-5 and 10 Under 35 U.S.C. § 103 over Revit

The grounds of rejection assert that claims 1-5 and 10 are rendered obvious by the disclosure of Revit. In particular, it is asserted that Revit suggests calibrating at least one recorded spoken word by controlling each of the at least one recorded spoken words to have substantially the same sound energy, as expressly required by independent claims 1

and 10. (It is noted that dependent claim 10 has been amended to delete this operative language and the language has been added to independent claim 8.) The alleged support for the rejection is found in Revit's calibration procedure 911 depicted in Fig. 9. In response, Applicant submits that the calibration procedure disclosed in Revit is completely different than the disclosed and claimed calibration procedure in the present application and, further, that the Revit calibration procedure does not in any way suggest the claimed calibration procedure in claims 1 and 10 of the present application.

In particular, at paragraph [0087] Revit discloses "the gain of the corresponding audio power amplifier is then adjusted so that the sound level measured at [a particular location] matches the calibration level achieved during the recording calibration." This method of calibration is similar to the prior art method discussed in the background section of the present application. That is, according to Revit the gain of the power amplifier driving the speaker is adjusted to achieve a predetermined level. In accordance with Revit, interference sounds are recorded and, additionally, a target speech signal is recorded. The target speech signal is then output from a power amplifier and loudspeaker designated for the target speech signal and the interference noise is output on multiple power amplifiers and respective loudspeakers designated for the noise. A test subject is strategically located with respect to the various loudspeakers and the amplifier gain for the target speech signal and the interference noise signal(s) are independently manually adjusted, i.e., by manipulating respective attenuators. (See, e.g., par. [0051]-[0052]).

The apparent object of the Revit invention is to assess performance of real-world hearing and hearing aids. The loudness level, i.e., amplifier gain, for the speech signal and the interference signals are independently adjusted to simulate a real-world acoustic environment with respect to the test subject. Similar to the loudness adjustment processes

described in the background section of the present application, Revit does not contemplate the calibration of individual words relative to each other, i.e., by scaling their respective sound energies to be substantially the same. For at least the above reason Revit does not teach or suggest the calibrating step recited in independent claims 1 and 10 and, thus, claims 1 and 10 and those claims dependent thereon, in particular claims 1-5, are not rendered obvious over Revit.

The grounds of rejection further assert that Revit either teaches or suggests measuring a speech reception threshold utilizing the at least one calibrated spoken word because Revit's "tester keeps score ... of words repeated correctly by the listener." In response Applicant submits that Revit does not teach or suggest the claimed measuring step because Revit does not teach or suggest "the at least one calibrated spoken word" as discussed above. The grounds of rejection admit that Revit fails to "explicitly teach 'calibrated recorded spoken [words].'" (Office Action, page 12). Alternatively, it is asserted that Revit teaches recordings of "real conversations taking place in real-life environments" (par. [0099]) and that it would have been obvious to apply the calibration of the interference sounds, discussed above, to the words of the recorded conversations "because [Revit] teaches that the material he is recording may include words as portions of sentences." (Office Action, page 12). This argument simply does not follow. Just because the interference sounds and the sentences including words are both recorded does not imply that any given process applied to one is necessarily applied to the other. Specifically, just because the interference sounds are "calibrated" does not make it obvious to also "calibrate" recorded conversations.

Furthermore, even if it were obvious to calibrate the recorded sentences in Revit merely because the recorded interference sounds were calibrated, the claimed invention is

still not rendered obvious because Revit fails to teach or even suggest calibrating the words by controlling each of the at least one recorded spoken words to have substantially the same sound energy. For this additional reason Revit does not render any of claims 1-5 and 10 obvious under 35 U.S.C. § 103.

Rejection of Claims 6 and 7 Under 35 U.S.C. § 103 over Revit in view of Shennib and Delisle or Parrot Software

Claims 6 and 7 are rejected under 35 U.S.C. § 103 as being unpatentable over Revit in view of Shennib and Delisle or Parrot Software. Claims 6 and 7 depend from claim 1 and, thus, are patentable at least for the same reasons that claim 1 is patentable, discussed above.

Rejection of Claims 8, 9 and 11-16 Under 35 U.S.C. § 103 over Engebretson

Claims 8, 9 and 11-16 are rejected under 35 U.S.C. § 103 as being unpatentable over Engebretson. As discussed in Applicant's previous response, i.e., to the Office Action dated July 18, 2005, the calibration procedure disclosed in Engebretson, disclosed, for example, at columns 14-17, is completely different than the claimed calibration procedure, both in function and result. Specifically, in Engebretson, the calibration step "gathers preliminary data on the hearing aid and its characteristics when inserted in the patient's ear". For instance, "it is desirable to calibrate for the ear impedance". (Col. 16:26-27). The steps of the calibration procedure of Engebretson include producing a series of fixed-frequency test sounds, each sound being within a different frequency range. Using these different fixed-frequency sounds "the actual sound pressure level SPL(F) in the patient's ear" is determined. (Col. 16:61-64). The results of this calibration procedure are then used "together with measurements of the auditory area (defining the patient's hearing) to then automatically calculate filter parameters." (Col. 14:31-34). Accordingly, the calibration step

in Engebretson does not include making respective sound energies of recorded spoken words equal, as required by independent claims 8 and 15. For at least this reason, Engebretson does not render obvious the subject matter recited in either of claims 8 and 15, or any claims dependent therefrom, specifically, claims 9, 11-14 and 16, respectively.

Further, Engebretson does not teach or suggest presenting recorded spoken words, each with the same sound energy, i.e., calibrated, to a test subject. Instead, as discussed above, Engebretson discloses presenting fixed-frequency sounds, or tones. For this additional reason, Engebretson does not render obvious any of claims 8, 9 and 11-16.

Lastly, Engebretson does not teach or suggest measuring the speech intelligibility level of a test subject by using recorded spoken words of equal sound energy, i.e., by using the "calibrated" words. Instead, Engebretson discloses calculating filter parameters by using the results of a calibration procedure in conjunction with "measurements of the auditory area", which define the patient's hearing. (Col. 14:31-34). Thus, not only is the calibration procedure of Engebretson different in process than the claimed calibration, as discussed above, but the calibration result in Engebretson is not even utilized as part of the measurement of the patient's hearing. A completely separate measurement is used for that purpose.

For the reasons set forth above, Engebretson does not render obvious any of independent claims 8 and 15, or any of the claims dependent on these claims, specifically, claims 9, 11-14 and 16.

Rejection of Claims 13 and 14 Under 35 U.S.C. § 103 over Engebretson in view of Shennib and Delisle or Parrot Software

Claims 13 and 14 are rejected under 35 U.S.C. § 103 as being unpatentable over Engebretson in view of Shennib and Delisle or Parrot Software. Because claims 13 and 14

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each depends from independent claim 8, which is patentable as discussed above, and because none of Shennib, Delisle and Parrot Software compensates for the deficiencies discussed above related to Engebretson, Applicant submits that claims 13 and 14 are patentable over the art of record for at least the same reasons as set forth above.

Conclusion

In view of the above amendments and remarks, entry of the present Amendment, reconsideration of the previous rejections and allowance of this application are respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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Reply to Final Office Action of December 27, 2005
Annotated Sheet Showing Changes

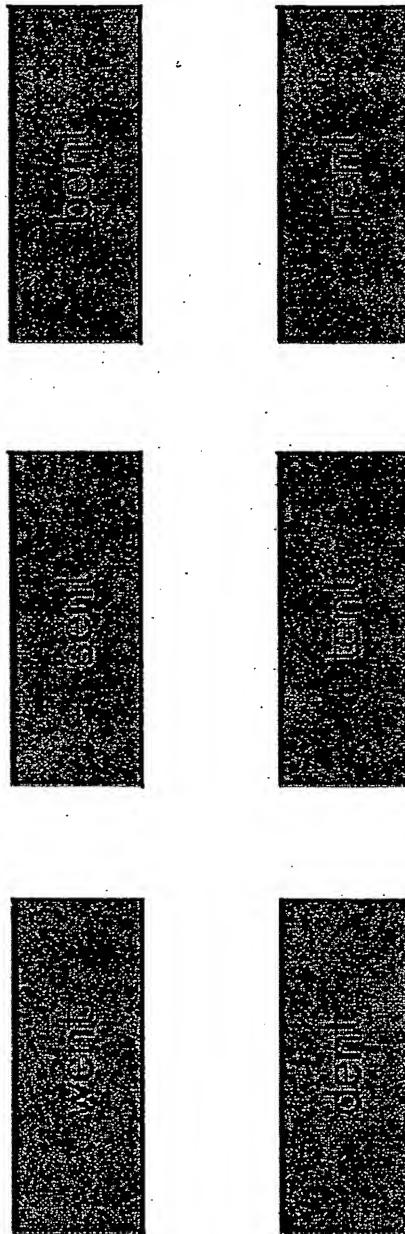
125

U.S. Army Aeromedical Research Laboratory

Modified Rhyme Test (ANSI S3.2-1889)

~~delete~~

Count



Modified Rhyme Test

Fig. 1D
ATTORNEY-CLIENT-PRIVILEGED



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U.S. Army Aeromedical Research Laboratory

Modified Rhyme Test (ANSI S3.2-1989)

Delete

50 Attenuation Channel 1
 50 Attenuation Channel 2



Modified Rhyme Test

Att. Name _____ First Name _____ ID Number _____

Experimental Conditions _____

C:\HPC\Stimuli\Akroon\Akroon 50 dB

Fig. 1C

ATTORNEY-CLIENT PRIVILEGED